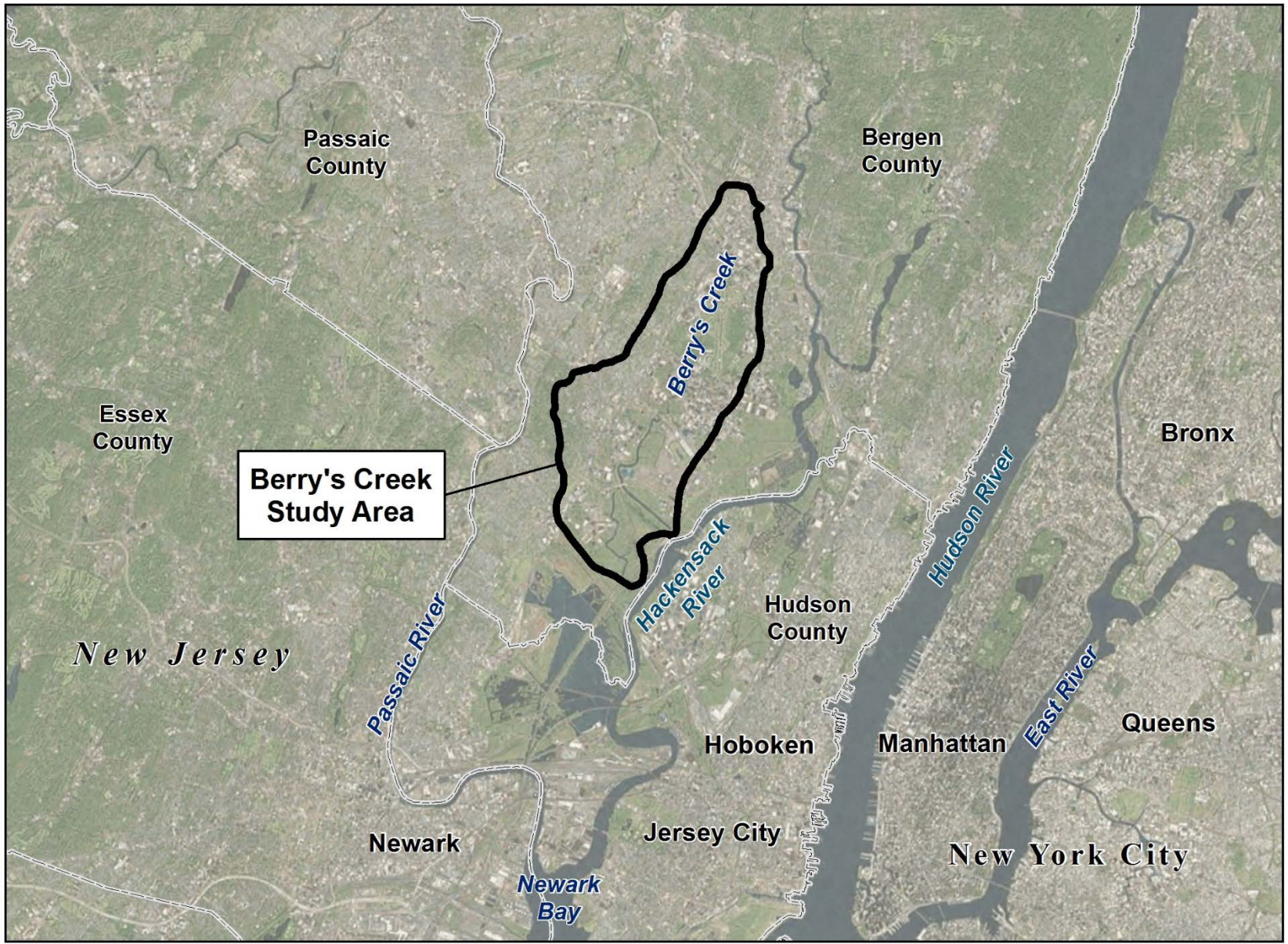


A photograph of a river with reeds in the foreground and a city skyline in the background. The river flows from the left towards the center, with a bridge visible in the distance. The city skyline includes several tall buildings, with the most prominent one being the Empire State Building. The sky is a clear, pale blue.

Adapting Adaptive Site Management to the Superfund Process for the Berry's Creek Study Area

Doug Tomchuk – USEPA Region 2
Peter Brussock – The ELM Group

January 10, 2017

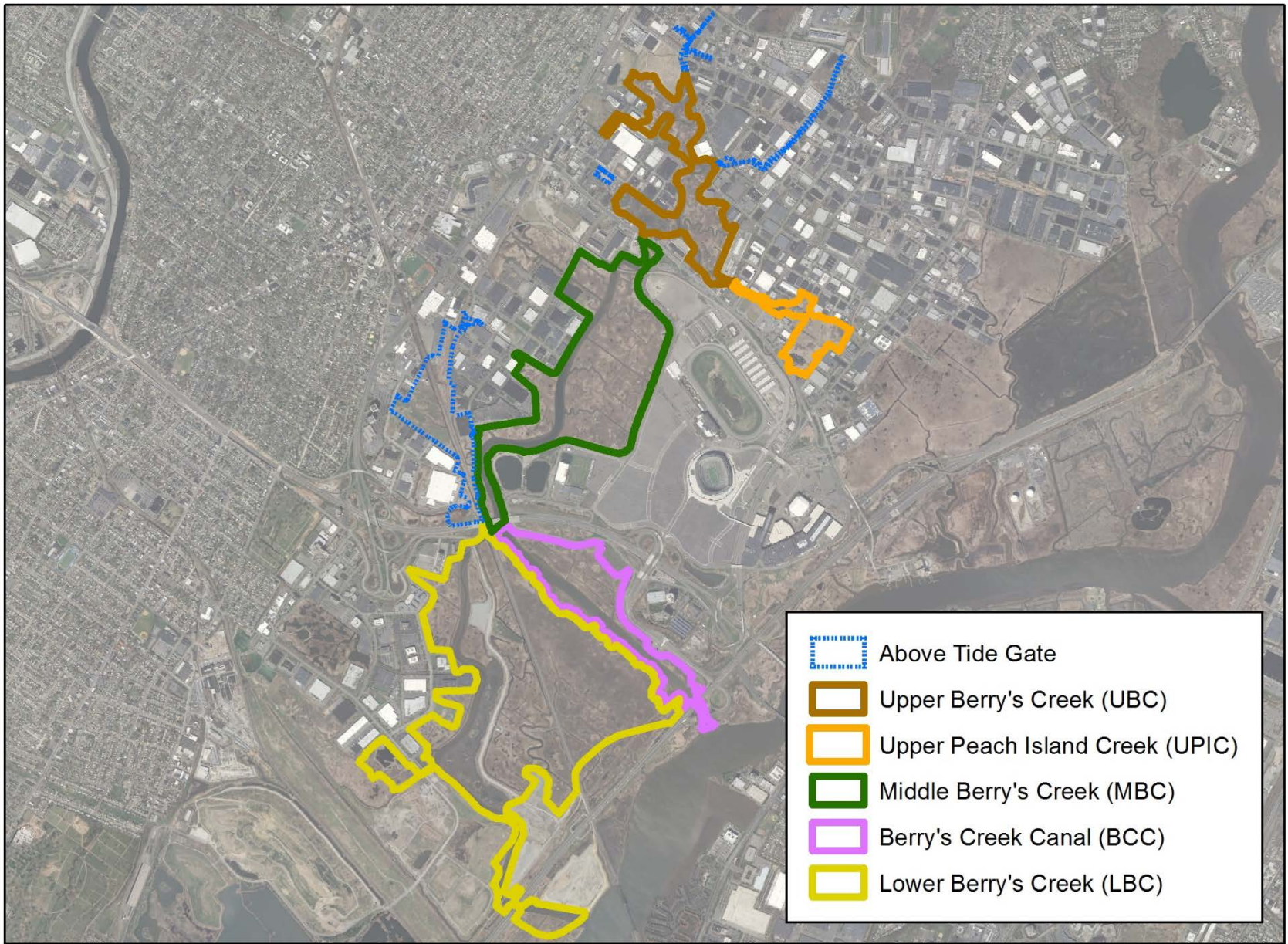


**Berry's Creek
Study Area**

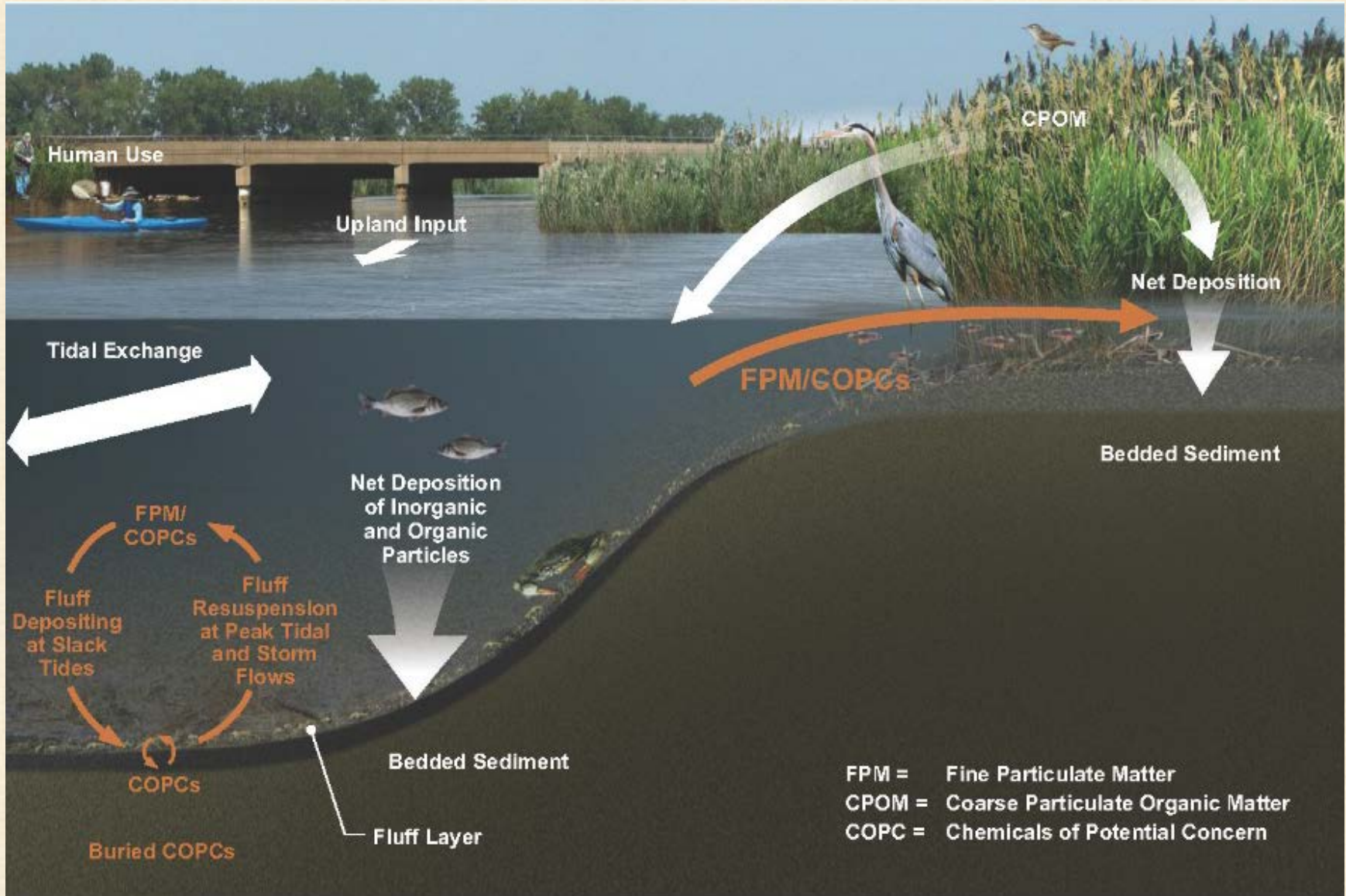
Berry's Creek

- **6.5 Miles**
- **Tidal Tributary of Hackensack River**
- **Approximately 1000 acres wetlands**
- ***Phragmites*-dominated marsh**
- **Mercury, MeHg, PCBs**
- **Data collections every year from 2009 to 2015 (+)**
- **Progression from chemical distribution to understanding processes**
- **Comprehensive CSMs**
- **Draft Remedial Investigation Complete**

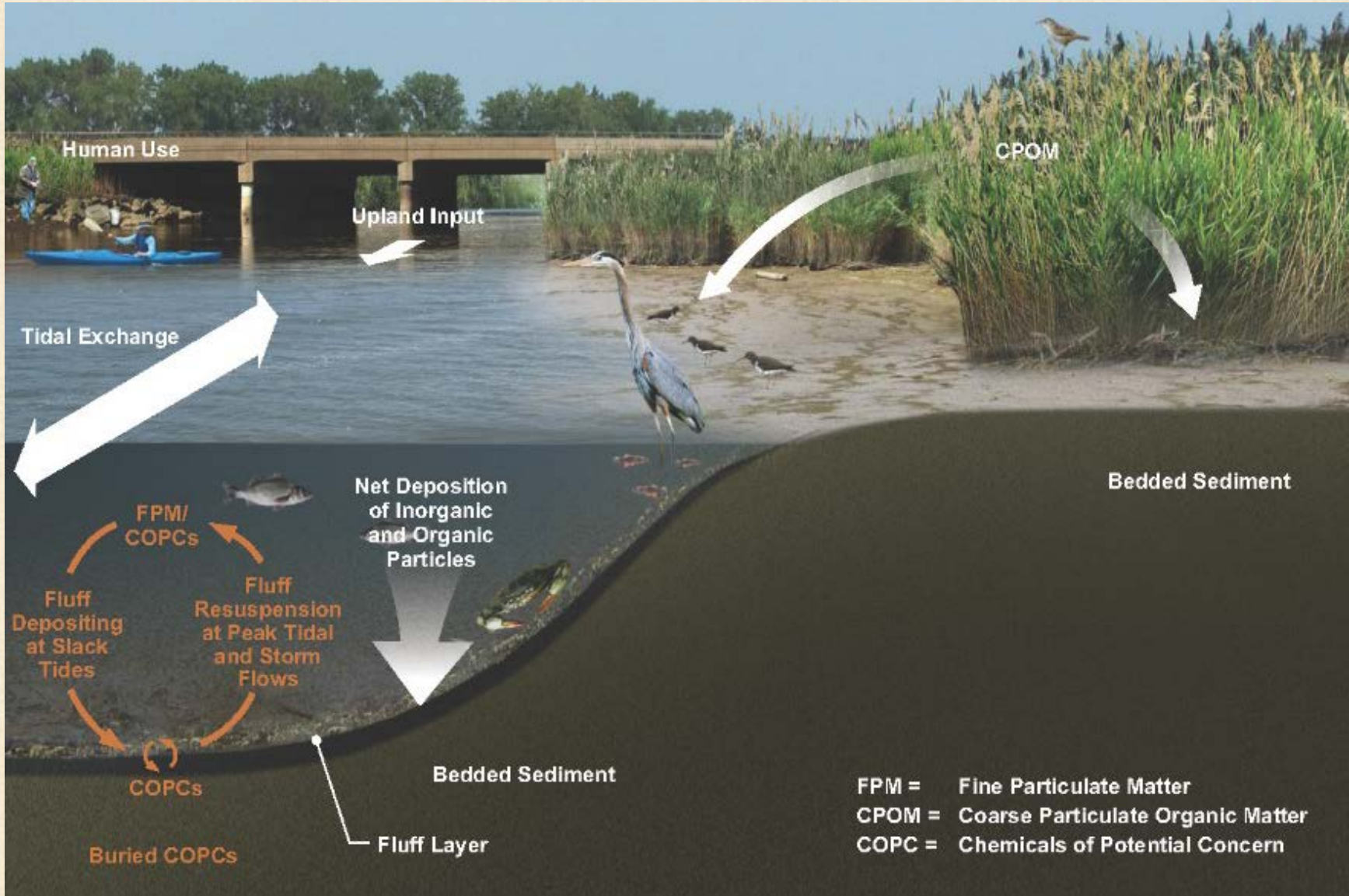




High Tide



Low Tide



Why Should We Consider Adaptive Site Management?

Despite rigorous efforts to characterize sediment sites and make appropriate cleanup decisions, there are still many uncertainties that may influence the success of the project

Adaptive Site Management

- **Different than trial and error**
- **ASM can be a framework for the implementation of a remedial action and includes additional efforts to generate knowledge**
 - **Initial remedial scope directed towards actions with confidence in desired outcome**
 - **Response monitored, interpreted used to adjust program in iterative manner, based on reduced uncertainty**
 - **Improve knowledge and performance**

Adaptive management plans for unanticipated outcomes by collecting information

Adaptive Site Management in Superfund

- **No explicit EPA guidance on ASM**
- **SMWG presentations on ASM in the past seem (to EPA) to resemble the addition of a phase of pilot studies more than a plan for full scale remediation**
- **PRP allocation considerations would vary with phases of remedy**
- **EPA does not want to take on risk**
 - **Does not want a less protective remedy**
 - **Longer time to complete remediation**
- **EPA still requires decision documents to satisfy NCP**

Why is the BCSA an appropriate candidate for ASM?

- **We have studied the site extensively in an adaptive process**
 - **Have a strong CSMs well supported by multiple lines of evidence**
 - **Can predict outcomes of initial remediation**
- **Still have uncertainty**
 - **Mercury methylation/demethylation dynamics**
 - **Marsh/waterway exchange**
 - **Recontamination factors**
 - **Wetlands restoration**
 - **Sea level rise**
 - **Flood control concerns**

EPA Requirements for Adaptive Site Management at BCSEA

- **Large scale initial remedial action that will reduce exposure/risks as well as the associated uncertainties**
 - **Able to evaluate the area being addressed**
 - **Larger than pilot studies**
- **An interim remedy**
- **Still issue decision documents**
- **Details to be evaluated in Feasibility Study**

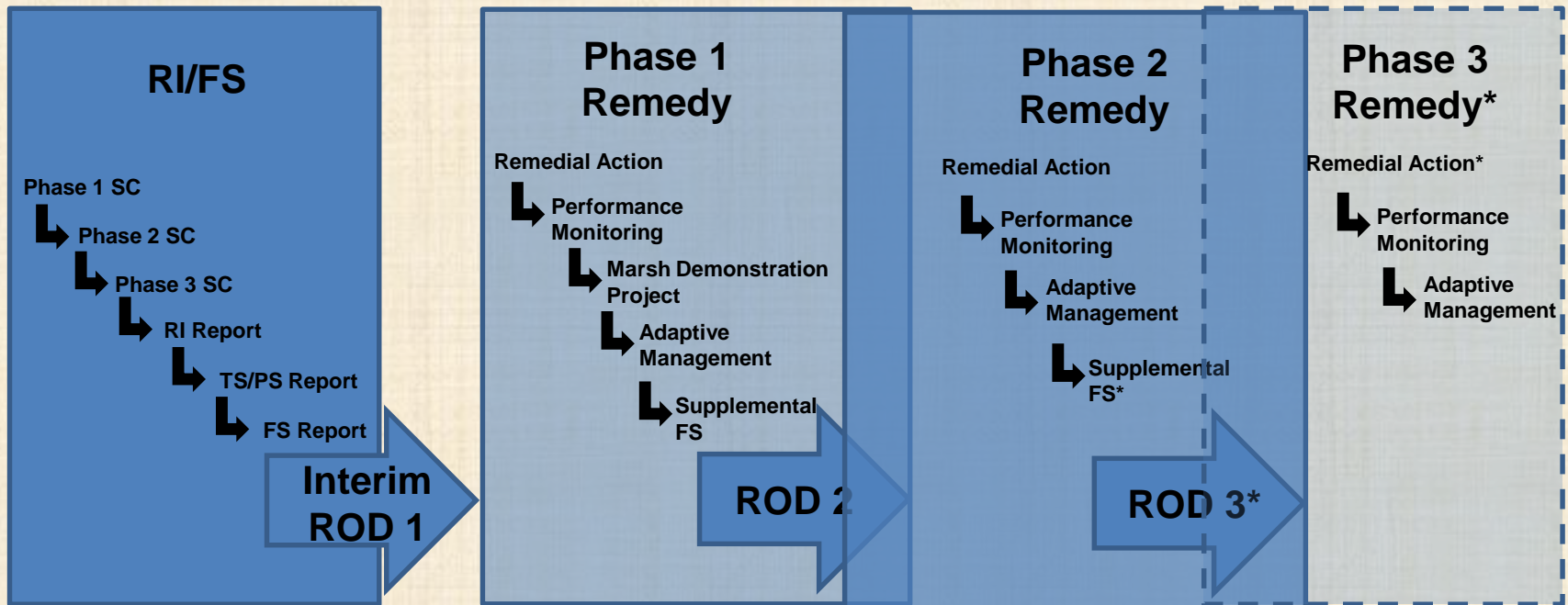
Proposed Phase 1 Remediation Area



Preliminary Consideration of Phase 1 Remedy

- **Interim Remedy**
- **Source Control**
 - **Bank-to-bank in waterway (UBC & MBC)**
 - **Tributaries**
 - **No derivation of cleanup numbers**
 - **No direct evaluation of MNR**
- **Still Need to Complete Feasibility Study**
 - **Depth of removal TBD**
 - **Capping detail TBD**
- **Marsh Demonstration Project**
- **Second ROD Required**

BCSA Phased/Adaptive Approach



* If necessary, SC = Site Characterization, RI = Remedial Investigation, TS/PS = Treatability Study/Pilot Study, FS = Feasibility Study
ROD = Record of Decision

Benefits of ASM for BCSA

- **Move forward with remediation of highest risk/mobility areas sooner**
- **Optimize risk reduction by learning from monitoring response of system to initial substantial actions**
- **Minimize impacts to marsh system (net environmental benefit)**
- **Collecting information to minimize or address uncertainties, which informs subsequent remedial action decision(s)**
- **Cooperative approach between EPA and BCSA Group**
- **Public expectations can be more realistic**

Questions?